	Application No.	Applicant(s)
Notice of Allowability	10/608,921	LU ET AL.
	Examiner	Art Unit
	Lynne A. Gurley	2812
The MAILING DATE of this communication apper All claims being allowable, PROSECUTION ON THE MERITS IS herewith (or previously mailed), a Notice of Allowance (PTOL-85) NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RI	(OR REMAINS) CLOSED in to or other appropriate communication is sufficiently. This application is sufficiently application of the communication is sufficiently application.	his application. If not included ication will be mailed in due course. THIS
1. This communication is responsive to the application filed 6	<u>5/27/03</u> .	
2. Mathematical The allowed claim(s) is/are <u>1-30</u> .		
3. $\boxtimes$ The drawings filed on <u>14 October 2003</u> are accepted by the	e Examiner.	
4. ☐ Acknowledgment is made of a claim for foreign priority unallowed allowed by ☐ Some* c) ☐ None of the:  1. ☐ Certified copies of the priority documents have 2. ☐ Certified copies of the priority documents have 3. ☐ Copies of the certified copies of the priority documents have allowed allowed by a copies of the certified copies of the priority documents have allowed by a copies of the priority documents have allowed by a copies of the priority documents have allowed by a copies of the certified copies of the priority documents have allowed by a copies of the priority documents have allowed by a copies of the priority documents have allowed by a copies of the priority documents have allowed by a copies of the priority documents have allowed by a copies of the priority documents have allowed by a copies of the priority documents have allowed by a copies of the priority documents have allowed by a copies of the priority documents have allowed by a copies of the priority documents have a cop	e been received. e been received in Application	No
Applicant has THREE MONTHS FROM THE "MAILING DATE" noted below. Failure to timely comply will result in ABANDONN THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.		reply complying with the requirements
5. A SUBSTITUTE OATH OR DECLARATION must be subm INFORMAL PATENT APPLICATION (PTO-152) which give		
6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") mus  (a) ☐ including changes required by the Notice of Draftspers  1) ☐ hereto or 2) ☐ to Paper No./Mail Date  (b) ☐ including changes required by the attached Examiner's Paper No./Mail Date  Identifying indicia such as the application number (see 37 CFR 1 each sheet. Replacement sheet(s) should be labeled as such in the page of the pa	son's Patent Drawing Review . s Amendment / Comment or i .84(c)) should be written on the he header according to 37 CFR	n the Office action of drawings in the front (not the back) of 1.121(d).
<ol> <li>DEPOSIT OF and/or INFORMATION about the depo attached Examiner's comment regarding REQUIREMENT</li> </ol>		
Attachment(s)  1. ☑ Notice of References Cited (PTO-892)  2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)  3. ☑ Information Disclosure Statements (PTO-1449 or PTO/SB/0 Paper No./Mail Date 10/14/03  4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material	6. ☐ Interview Sur Paper No./N 7. ☑ Examiner's A	rmal Patent Application (PTO-152) nmary (PTO-413), lail Date mendment/Comment tatement of Reasons for Allowance
		PRIMARY PATENT EXAMINER TC 2800, AU 2812

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## **EXAMINER'S AMENDMENT**

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR
 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows to clarify a typographical error (in accordance with the specification, page 7, line 22 (last line of the page)):

In claim 9, line 1, "n > 25" has been replaced by "n < 25";

In claim 19, line 1, "n > 25" has been replaced by "n < 25";

In claim 27, line 1, "n > 25" has been replaced by "n < 25".

## **Reasons For Allowance**

- 2. The following is an examiner's statement of reasons for allowance: The prior art of record fails to teach or to suggest, either alone or in combination, the steps of the claimed invention, especially the steps of:
- 3. "exposing said semiconductor wafer to a H-S-R solution to form a S-R layer over said copper interconnects; and depositing a layer of dielectric material over said semiconductor wafer after removing said S-R layer with an in-situ plasma pretreatment of said semiconductor wafer with a hydrogen containing plasma." (claim 1)
- 4. "forming a S-R layer over said copper interconnects by polishing a copper interconnect layer with a slurry that includes H-S-R; exposing said semiconductor wafer to a H-S-R solution; and depositing a layer of dielectric material over said semiconductor wafer after removing said

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S-R layer with an in-situ plasma pretreatment of said semiconductor wafer with a hydrogen containing plasma." (claim 11)

- 5. "forming said copper interconnects by polishing a copper interconnect layer with a slurry that includes H-S-R, said polishing step also forming a S-R layer over said copper interconnects; and depositing a layer of dielectric material over said semiconductor wafer after removing said S-R layer with an in-situ plasma pretreatment of said semiconductor wafer with a hydrogen containing plasma." (claim 21)
- 6. "forming said copper interconnects by polishing a copper interconnect layer with a slurry that includes HSC<sub>16</sub>H<sub>33</sub>, said polishing step also forming a S-R monolayer over said copper interconnects; dipping said semiconductor wafer in a solution containing HSC<sub>16</sub>H<sub>33</sub>, said dipping step performed in-situ with said cleaning step; and depositing a layer of dielectric material over said semiconductor wafer after removing said S-R monolayer with an in-situ plasma pretreatment of said semiconductor wafer with a NH<sub>3</sub> plasma." (claim 21)
- Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynne A. Gurley whose telephone number is 571-272-1670. The examiner can normally be reached on M-F 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on 571-272-1679. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lynne A. Gurley
Primary Patent Examiner

TC 2800, AU 2812

LAG June 8, 2004